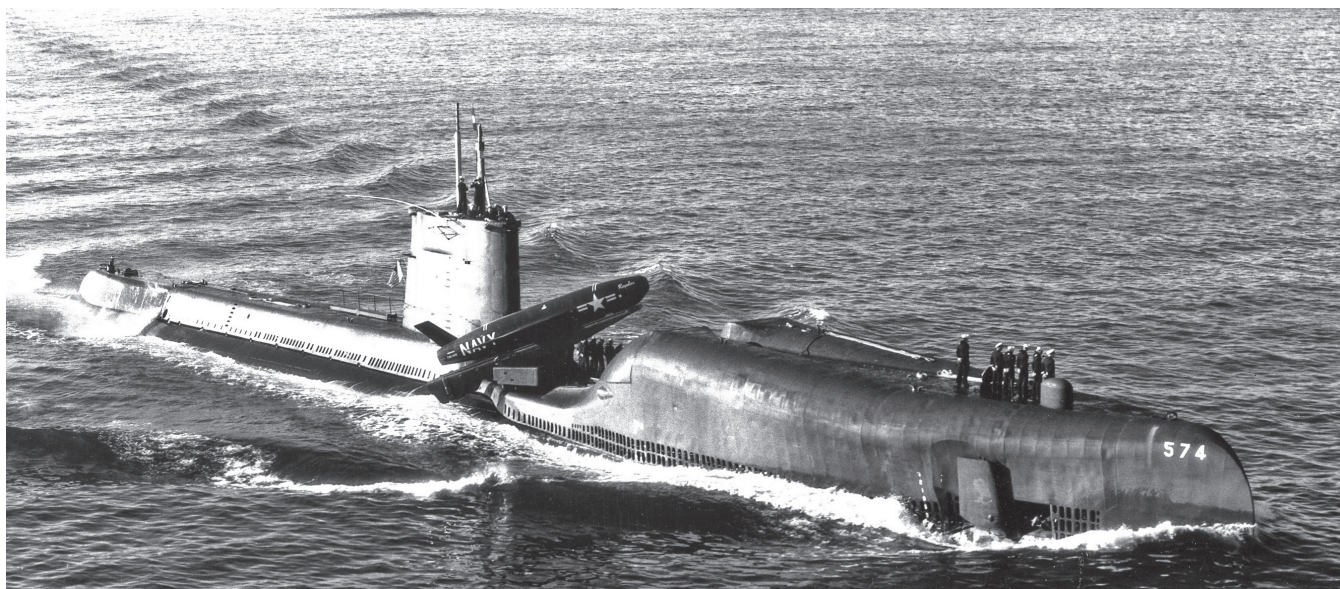


Charting a Parallel Course



A Regulus nuclear-armed cruise missile sits aboard the USS Grayback submarine. The Regulus, designed by Los Alamos, was the first nuclear weapon to enter the Navy's stockpile. (Photo: Open Source)

Los Alamos and the U.S. Navy: Partners Since World War II

On December 7, 1941, Imperial Japanese forces launched a surprise attack against the U.S. Pacific Fleet at Pearl Harbor. This attack, which claimed the lives of 2,400 Americans, marked America's entry into World War II and, ironically, represented the beginning of the end of Imperial Japan, which would suffer defeat after defeat at the hands of the U.S. Navy in the years to come. The final blow to Imperial Japan came in the form of two atomic bombs in 1945. Surprisingly, the Navy also played an important role in the development of these weapons and has continued to be a key partner with the institution responsible for designing, constructing, and delivering them: Los Alamos National Laboratory.

The Navy's first major contribution to Los Alamos was by providing the Laboratory with one of its best experts in ordnance: Captain William Sterling Parsons. Known as "Deak" (short for Deacon, a nickname he acquired during his days as a midshipman at the Naval Academy that played off his last name), Parsons became the head of the Laboratory's Ordnance Division in June 1943. Little more than a year after arriving in Los Alamos, Parsons was promoted to associate director. (To put that promotion in perspective, his only peer as associate director was the legendary Italian Nobel Laureate Enrico Fermi.)

Deak Parsons moved to Fort Sumner, New Mexico, at the age of 8 where he learned to speak fluent Spanish. He attended the United States Naval Academy in Annapolis, Maryland, from 1918–1922 and eventually returned to New Mexico in 1943 to work at Los Alamos. (Photo: Open Source)

The Ordnance Division was tasked with engineering and building the final combat-versions of the experimental atomic weapons. For example, under Parsons's guidance, the Navy built the special-purpose gun barrel that became the heart of Little Boy's "gun-type" weapon design that was used to destroy Hiroshima.



In addition to serving as a division leader and as an associate director, Parsons co-lead Project Alberta with future Nobel Laureate Norman Ramsey. The Alberta team was responsible for overseeing the safe delivery of nuclear bomb components from Los Alamos to Tinian Island.

(After its capture in August 1944, the Navy built Tinian into one of the largest airfields of the war—essentially a 39-square-mile island airfield from which to bomb Japan.) Little Boy's key components, including the uranium projectile to be fired in the bomb's Navy-built gun, were delivered to Tinian aboard the cruiser USS *Indianapolis*. (The *Indianapolis* was sunk by a Japanese submarine shortly after delivering its nuclear cargo. Only 317 of the ship's crew of 1,196 survived—the greatest loss of life in a single incident in the history of the Navy.)

Once the components were delivered, the Alberta team constructed the bombs, maintained them, and loaded them aboard B-29 bombers. Parsons, concerned about the possibility of a crash during takeoff, decided to personally arm Little Boy after it was in flight and then witnessed the culmination of the Manhattan Project when the bomb successfully detonated over Hiroshima. (A naval officer also armed Fat Man, the bomb deployed against Nagasaki.) For his wartime efforts, Parsons was promoted to commodore and awarded the Silver Star and Navy Distinguished Service Medal.

The war would soon come to a close, as would Parsons's time at Los Alamos, but the partnership between the Navy and the Laboratory was only beginning.

Before Parsons came to Los Alamos, he worked at the Naval Proving Ground at Dahlgren, Virginia, with a young Naval Reserve commander named Norris Bradbury. Parsons ordered Bradbury, a Berkeley-trained Stanford professor, to join him in

New Mexico in 1944. Bradbury was assigned to work on the complex implosion-type design (that became the Fat Man bomb), wrote the procedure for conducting its test—the Trinity Test, and played the lead role in assembling the device for the Trinity Test.

After the war, though he had hoped to return to Stanford, Bradbury reluctantly agreed to serve for six months as Oppenheimer's successor as Laboratory director; he ultimately served for 25 years. Bradbury turned out to be the ideal leader to guide the Laboratory through the uncertainty of the postwar years.

At the end of the war, the Laboratory faced an uncertain future: it had a product (nuclear weapons), but it lacked a customer. Fortunately, the Navy arrived on the scene in the closing months of 1945. Atomic weapons had revolutionized warfare, and naval leaders hoped to determine whether their ships could survive a nuclear blast. The Navy collected a test fleet comprised of dozens of captured and surplus World War II ships of various types, and Los Alamos prepared nuclear weapons to use against them. The operation was code-named Crossroads and conducted at the Marshallese atoll of Bikini. These important weapons-effects tests confirmed naval vessels were vulnerable to atomic attack.



On July 24, 1946, the Crossroads test (using a device identical to Fat Man) was detonated 90 feet below the surface of Bikini Lagoon. The test was conducted for the Navy by Los Alamos to assess how well naval vessels could withstand a nuclear blast. The 21-kiloton yield caused several warships to sink. The battleship USS *Nevada* remained afloat but suffered significant damage. (Photo: Los Alamos)



According to Bradbury, the Navy kept the Laboratory in business. “What held the place together was the Navy’s program to determine the effects of nuclear bombs against naval vessels,” he said. Today, the Bradbury Science Museum in Los Alamos is named in his honor.

In the decades that followed, Los Alamos designed a wide variety of nuclear weapons for the Navy. The first nuclear weapon to enter the Navy’s stockpile was the Regulus, a large cruise missile that could be fired from the deck of a submarine. Other innovative weapons systems used by the Navy soon followed, including the Special Atomic Demolition Munition (SADM). The SADM was a low-yield tactical nuclear weapon that could be delivered by a scuba diver. Los Alamos also developed atomic depth bombs, torpedoes, rockets, and even a 16-inch-diameter nuclear projectile that could be fired from a battleship.

During the 1960s and 1970s, Lawrence Livermore National Laboratory designed the warheads that armed the Navy’s Polaris and Poseidon submarine-launched ballistic missiles (SLBMs). The year 1979 marked the transition from Livermore-designed warheads to Los Alamos-designed warheads when the Navy armed its new Trident I SLBM. Today, these Los Alamos-designed warheads continue to arm the Navy’s current SLBM—the Trident II.

Given the close and ongoing nature of the Navy-Los Alamos partnership, it should come as no surprise that a naval vessel once bore the name *USS Los Alamos*. The *Los Alamos*, a floating dry dock used to service nuclear submarines, enjoyed a long and useful career from 1961–1994. Today, there is growing interest in resurrecting the name *USS Los Alamos*. On December 15, 2015, the Los Alamos County Council voted unanimously to approve a resolution requesting that a future U.S. Navy submarine receive the name *Los Alamos*.



The Special Atomic Demolition Munition (SADM) was a portable nuclear weapon in the U.S. stockpile during the 1960s. Although SADMs were never used in combat, the Navy tested a version that could be used to attack targets accessible by sea. (Photo: Los Alamos)

This gesture serves as a tribute to those in the community who have served in the Navy, those who helped develop the nation’s sea-based nuclear deterrent, and as an enduring symbol of a nearly 75-year partnership that has served the nation’s best interests.

The Navy-Los Alamos partnership was forged during the dark days of history’s most deadly conflict. Today, the partnership continues. For example, every year, midshipmen from the U.S. Naval Academy vie for summer internships at the Laboratory (through the National Nuclear Security Administration’s Service Academies Research Associates program). For up to six weeks, interns receive hands-on scientific and engineering experience working to solve real challenges in U.S. national security. The program perpetuates the Lab’s partnership with the Navy and fosters military decision-makers who will better understand and appreciate the science and technology capabilities of the Laboratory.

The Laboratory continues to ensure the safety and reliability of every naval nuclear weapon, while the Navy reminds adversaries that acts of aggression against the United States or her allies will be met, just as they were in 1941, in a swift and decisive manner. ✦

~Alan Carr



The USS Los Alamos services a U.S. nuclear submarine in Holy Loch, Scotland. (Photo: Los Alamos)